

Applicant's submission of a copy of FR 1208367 (prior art cited on applicant's IDS) in response to the previous office action is acknowledged and appreciated. As stated previously, the document was not forwarded from PCT to this examiner as it should have been. It has now been considered. Applicant's only substantive argument is that the prior art does not teach the newly claimed limitation that the exhaust gas passages have a wider width than the coolant passages. As shown by the newly cited Kull patent, engineers at Behr (the assignee of the current application as well as the Kull patent) were well aware that the flow passages for the exhaust gas flow are about three times the width of the coolant passages in these exhaust gas heat exchangers.

Regarding the subject of official notice, it is not understood if applicant is challenging it. Nevertheless, it is hard to imagine that a manufacturer of heat exchange equipment as sophisticated as Behr would not know that heat exchangers are typically made of metal and soldered together. After all, the heat exchanger in Kull (assigned to Behr) is made of metal and soldered together. If applicants wish to go on record and challenge the subject of official notice, a declaration from the applicants, stating that they are unaware of any metal heat exchangers or the use of soldering as a method of joining metal heat exchanger parts together, will be considered by the examiner. Attorney argument will not suffice because it does not reflect what one of ordinary skill in this art knows.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 11-19 and 21 are rejected under 35 U.S.C. 103(a) as obvious over JP 06-194082 (Figure 3) in view of Kull et al (USP 5,931,219) and further in view of Tongu (USP 5,282,507, Figure 12B, elements 204 and 205) or Belovary (USP 3,734,177, element 44 with fingers 46) or Valyi (USP 3,331,435, Figure 4).

In Figure 3 of JP '082, the housing is shown between an inlet diffuser 2 and an outlet diffuser 3. One fluid flows through the common inlet connection 4 and out of connection 5. The other fluid flows between the inlet diffuser 2 and the outlet diffuser 3. A meandering strip seen in Figure 3 is shown more clearly in Figure 1 and appears to have passages that are approximately equal in width. To have made the meandering strip of metal, if it is not already disclosed to be of metal, would have been obvious to one of ordinary skill to improve heat transfer with the common use of metals in heat exchangers being taught in Kull (col. 5, lines 6-11). Regarding claim 21, in a claim directed to a heat exchanger apparatus, the intended fluids to be used in the apparatus do not impart patentability to the apparatus for the reasons stated in MPEP 2114, incorporated here by reference.

Kull teaches, in addition to metal construction which improves heat transfer, the use of exhaust gas passages triple the width of the coolant passages in an exhaust gas heat exchanger. To have sized the exhaust gas passages to be triple the width of the coolant passages when using the JP'082 heat exchanger to exchange heat between exhaust gasses and engine coolant would have been obvious to one of ordinary skill in the art to improve heat transfer and minimize pressure drop on the exhaust gas side of the heat exchanger as taught by Kull.

Each of Tongu (USP 5,282,507, Figure 12B, elements 204 and 205) or Bellovary (USP 3,734,177, element 44 with fingers 46) or Valyi (USP 3,331,435, Figure 4) teaches the comb-like closing-off construction of the meandering strip at each end of the heat exchanger as claimed by applicant. To have used such a comb-like construction as taught by any one of the enumerated references to close off the ends of the coolant channels in the prior art to JP '082 to simplify manufacture would have been obvious to one of ordinary skill in the art.

Claims 11-19 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combined teachings of Figure 12B of Tongu (USP 5,282,507) and JP 06-194082 and further in view of Kull et al (USP 5,931,219) and any one of Bellovary (USP 3,734,177, element 44 with fingers 46) or Valyi (USP 3,331,435, Figure 4).

This rejection relies on the same prior art as the first rejection however it has been combined in a slightly different way and is stated here as a separate rejection in order to avoid confusion.

To have attached diffusers such as shown in JP '082 at 2 and 3 to each end of the heat exchanger shown in Figure 12B of Tongu would have been obvious to one of ordinary skill in the art when adapting it to exchange heat with gases flowing in the straight fluid flow path through the heat exchanger. Such a modification would advantageously direct the flow in a straight fluid flow path without encountering a large pressure drop. Alternatively, to have constructed the heat exchanger, inlet and outlet ports and casing of JP '082 in the manner taught by Figure 12B of Tongu would have been obvious to one of ordinary skill in the art to simplify manufacture.

Kull teaches, in addition to metal construction which improves heat transfer and therefore would have been obvious to have used, the use of exhaust gas passages triple the width of the coolant passages in an exhaust gas heat exchanger. To have sized the exhaust gas passages to be triple the width of the coolant passages when using the Tongu /JP '082 heat exchanger to exchange heat between exhaust gases and engine coolant would have been obvious to one of ordinary skill in the art to improve heat transfer and minimize pressure drop on the exhaust gas side of the heat exchanger.

Each of Bellovary (USP 3,734,177, element 44 with fingers 46) or Valyi (USP 3,331,435, Figure 4), like Tongu, teaches the comb-like closing-off construction of the meandering strip claimed by applicant. To have used such a comb-like construction in the prior art to Tongu/JP '082 to simplify manufacture would have been obvious to one of ordinary skill in the art.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over any of the prior art combinations of references as applied to claim 11 above, and further in view of Bellovary et al (USP 3,734,177).

Bellovary teaches turbulator fins 43 inside the passages of a meandering plate heat exchanger such as taught by the prior art. To have added such turbulator fins 43 inside the passages of a meandering plate heat exchanger of the prior art to improve heat exchange would have been obvious to one of ordinary skill in the art. To have attached such a turbulator fin by the conventional technique of soldering (as disclosed in Kull and common knowledge in this art), would have been obvious to one of ordinary skill in the art.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John K. Ford whose telephone number is 571-272-4911. The examiner can normally be reached on Mon.-Fri. 9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler can be reached on 571-272-4834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/John K. Ford/  
Primary Examiner, Art Unit 3744